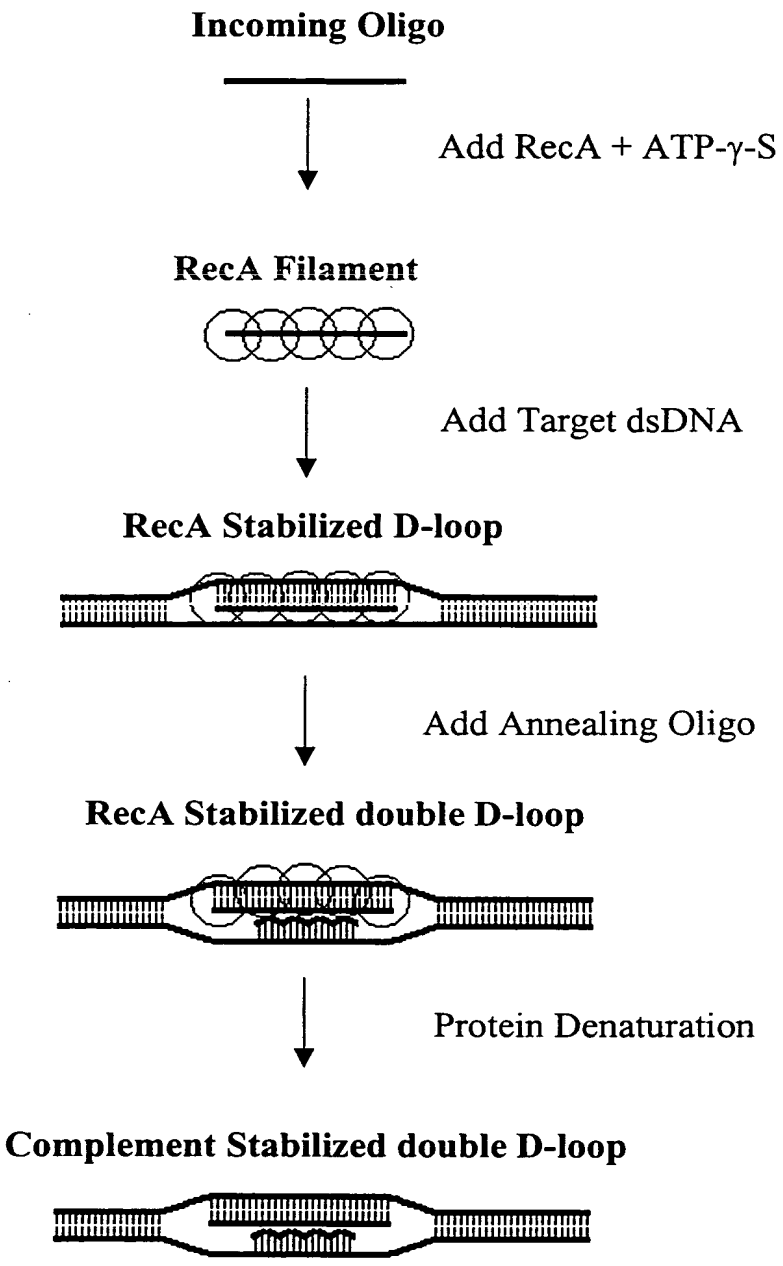

Incoming Oligo
Add RecA + ATP-γ-S
RecA Filament
Add Target dsDNA
RecA Stabilized D-loop
Add Annealing Oligo
RecA Stabilized double D-loop
Protein Denaturation
Complement Stabilized double D-loop

FIGURE 1

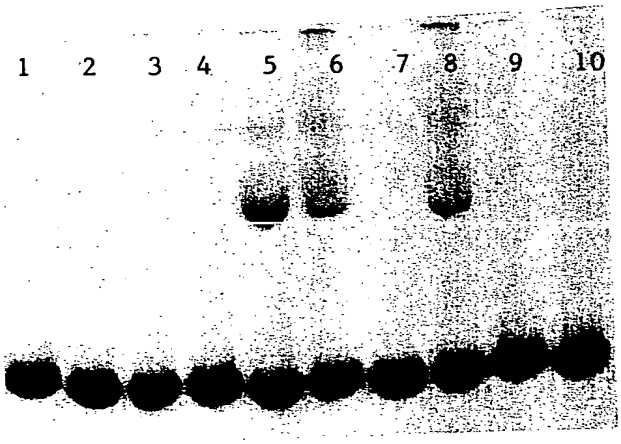


Figure 2

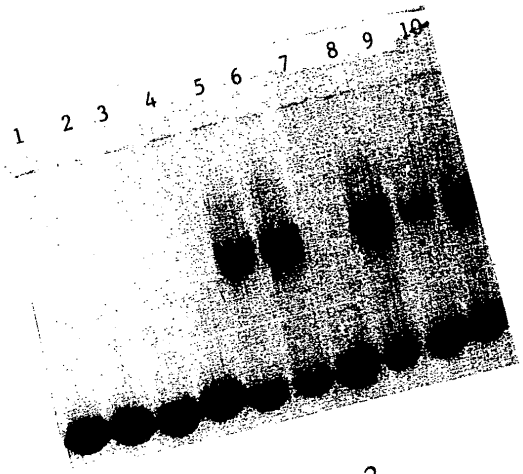


Figure 3

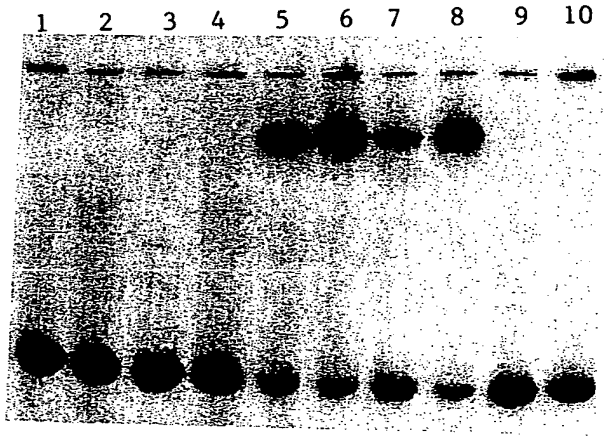


Figure 4

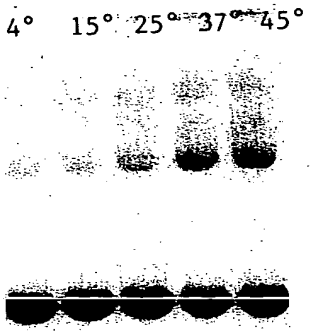


Figure 5

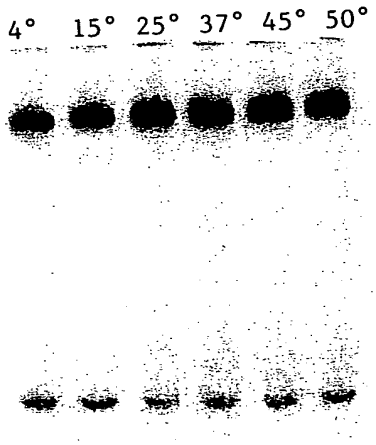


Figure 6

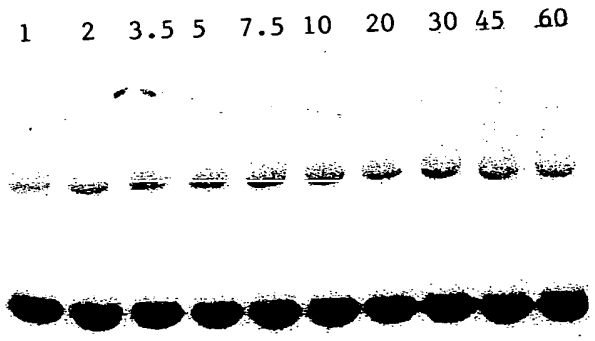


Figure 7

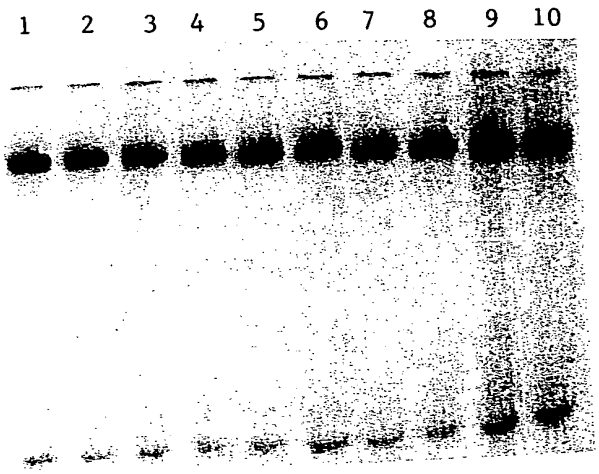
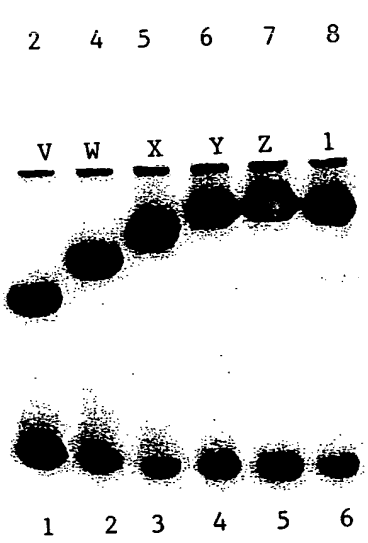


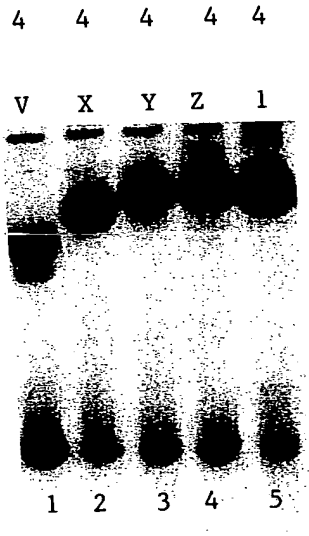
Figure 8



Annealing Oligo

Incoming Oligo

Figure 9



Annealing Oligo

Incoming Oligo

Figure 10

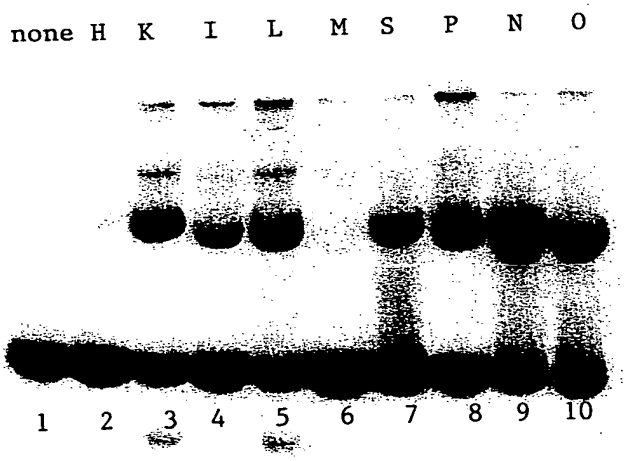


Figure 11

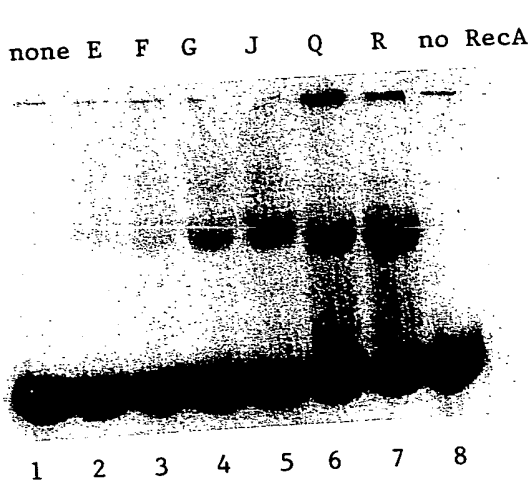


Figure 12

Oligonucleotide Sequence of the Kan⁻ Target

```
  1  CAGGGGATCA AGATCTGATC AAGAGACAGG ATGAGGATCG TTTCGCATGA
 51  TTGAACAAGA TGGATTGCAC GCAGGTTCTC CGGCCGCTTG GGTGGAGAGG
101  CTATTCGGCT ATGACTGGGC ACAACAGACA ATCGGCTGCT CTGATGCCGC
151  CGTGTTCCGG CTGTCAGCGC AGGGGCGCCC GGTTCTTTTT GTCAAGACCG
201  ACCTGTCCGG TGCCCTGAAT GAACTGCAGG ACGAGGCAGC GCGGCTATCG
251  TGGCTGGCCA CGACGGGCGT TCCTTGCGCA GCTGTGCTCG ACGTTGTCAC
301  TGAAGC
```

FIGURE 13

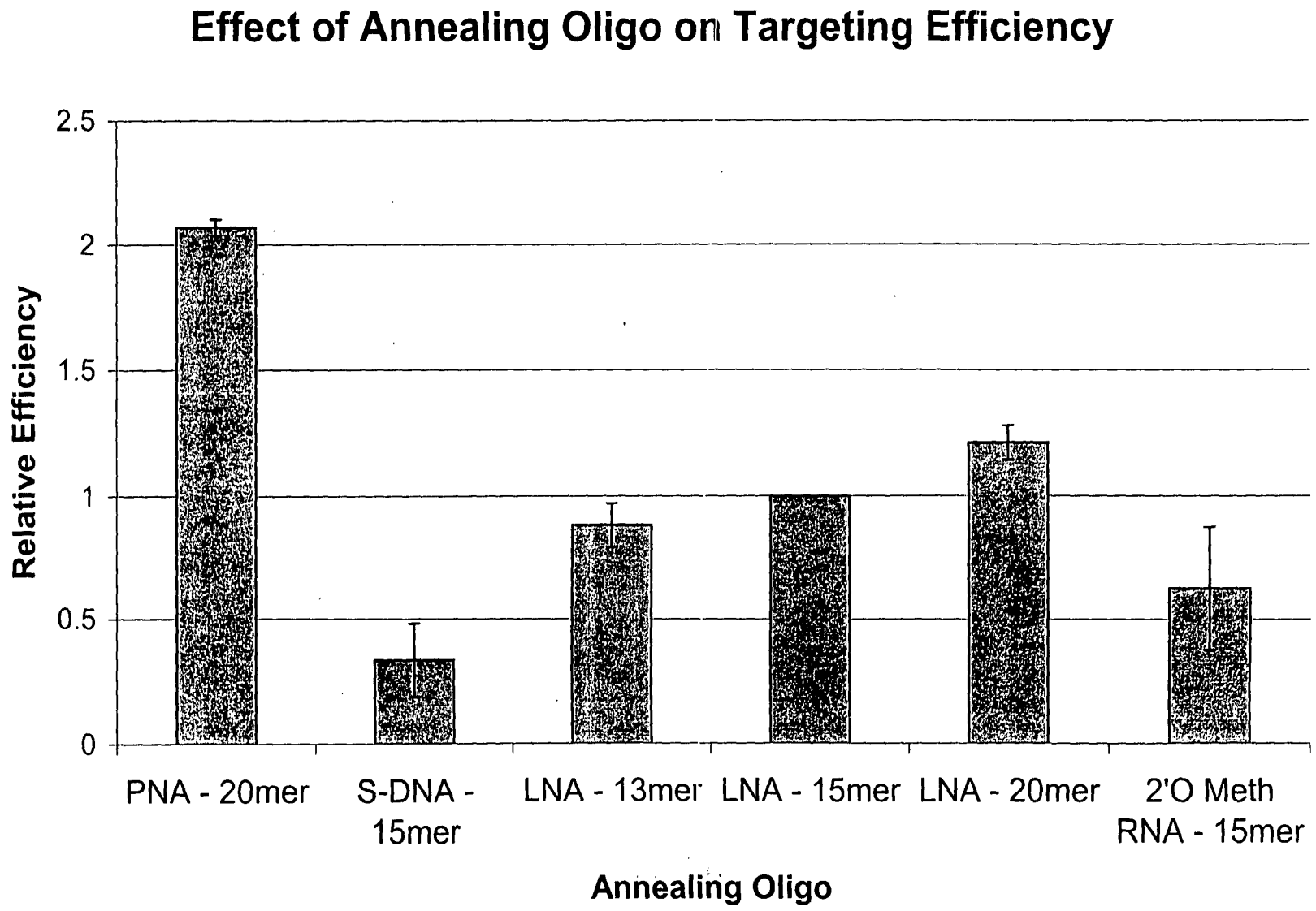

Effect of Annealing Oligo on Targeting Efficiency
Relative Efficiency
2.5
2
1.5
1
0.5
0
PNA - 20mer
S-DNA - 15mer
LNA - 13mer
LNA - 15mer
LNA - 20mer
2'O Meth RNA - 15mer
Annealing Oligo

FIGURE 14

Oligonucleotide Sequence of the Hyg$^-$ Target

```
  1  cgctgagata ggtgcctcac tgattaagca ttggtaactg tcagaccaag
 51  tttactcata tatactttag attgatttaa aacttcattt ttaatttaaa
101  aggatctagg tgaagatcct ttttgataat ctcatgacca aaatccctta
151  acgtgagttt tcgttccact gagcgtcaga ccccgtagaa aagatcaaag
201  gatcttcttg agatcctttt tttctgcgcg taatctgctg cttgcaaaca
251  aaaaaaccac cgctaccagc ggtggtttgt ttgccggatc aagagctacc
301  aactcttttt ccgaaggtaa ctggcttcag cagagcgcag ataccaaata
351  ctgtccttct agtgtagccg tagttaggcc accacttcaa gaactctgta
401  gcaccgccta catacctcgc tctgctaatc ctgttaccag tggctgctgc
451  cagtggcgat aagtcgtgtc ttaccggg
```

FIGURE 15

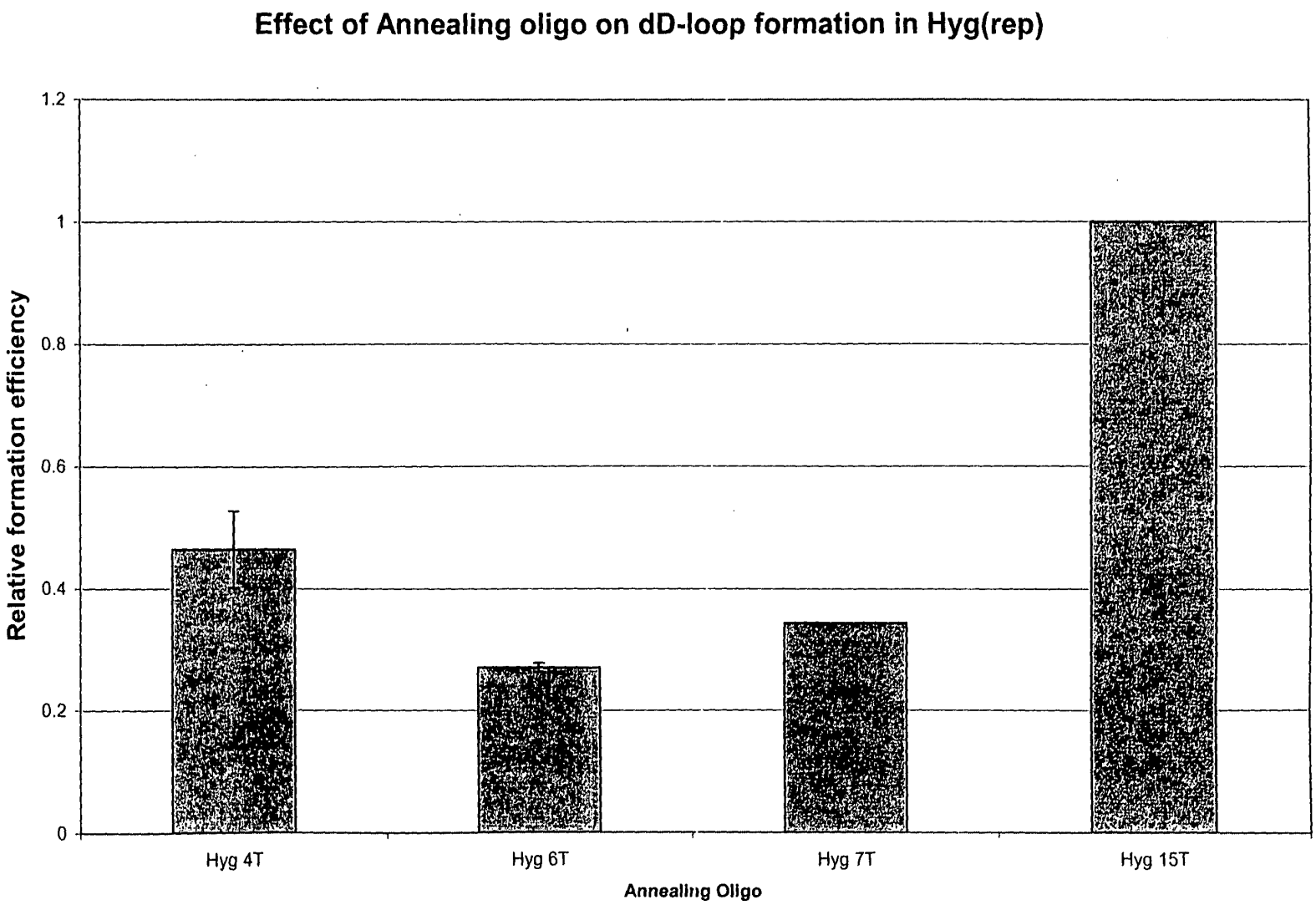

Effect of Annealing oligo on dD-loop formation in Hyg(rep)
Relative formation efficiency
1.2
1
0.8
0.6
0.4
0.2
0
Hyg 4T
Hyg 6T
Hyg 7T
Hyg 15T
Annealing Oligo

FIGURE 16

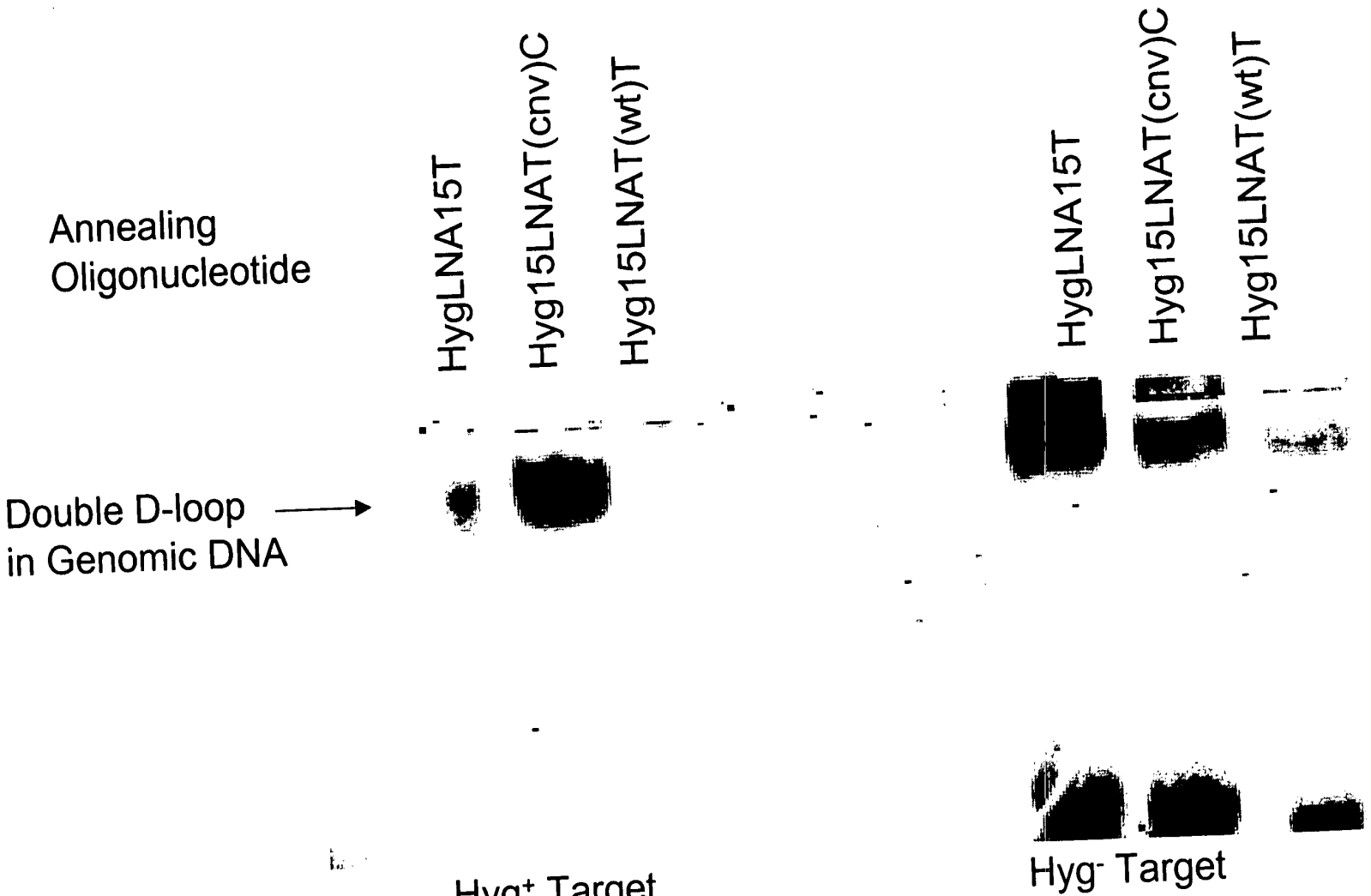

Annealing
Oligonucleotide
HygLNA15T
Hyg15LNAT(cnv)C
Hyg15LNAT(wt)T
HygLNA15T
Hyg15LNAT(cnv)C
Hyg15LNAT(wt)T
Double D-loop
in Genomic DNA
Hyg+ Target
Hyg- Target

FIGURE 17